

37th Annual Meeting, APS Division of Plasma Physics

6-10 November 1995, Louisville, KY

Abstract Submittal Form

Deadline: Friday, 7 July 1995

Subject Classification Category 4.1

[] Theory [X] Experiment

(Refer to the DPP Subject Category list on page M12.)

Observation of Energy Transfer Between Frequency Mismatched Laser Beams in a Large Scale Plasma, R. K. Kirkwood, B. B. Afeyan, W. L. Kruer, B. J. MacGowan, D. S. Montgomery, J. D. Moody, D. M. Pennington, and S. C. Wilks, LLNL — We have performed a series of experiments using the Nova laser which investigate the interaction of beams with slightly differing frequencies ($\Delta\omega/\omega \leq 2 \times 10^{-3}$) in a NIF-like plasma ($n/n_{cr} = 0.1$, $T_e = 3$ keV, scale length ~ 2 mm). Energy transfer is expected if the separation frequency ($\Delta\omega$) is close to the ion wave resonance (i.e.; $\Delta\omega = |\Delta k|c_s$). Measurements of the transmitted energy of a low intensity probe beam ($I \leq 1.5 \times 10^{15}$ W/cm² peak) intersected by a high intensity pump ($I = 5 \times 10^{15}$ W/cm² peak) at an angle of 53° show a peak amplification of as much as 2.5 over the case with no pump beam. The amplification is observed to be large only when the separation of the beam frequencies is near the ion acoustic resonance with the pump frequency higher than that of the probe. A scan of intensity indicates that the gain is constant (linear) for probe intensities up to 30% of the pump.

*Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract No. W-7405-ENG-48.

- ☒ Prefer Poster Session
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Submitted by:

 (Signature of APS Member)

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A faxed copy is not acceptable. This form, or a computer generated form, plus **TWO COPIES**, must be received by **Friday, 7 July, 1995** at the following address:

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